CRAY Station Software Service for APOLLO DOMAIN

Cray Research, Inc.

Introduction

Now, for the first time, the power of Cray Research supercomputers is brought to the sophisticated workstation user. As part of its continuing commitment to the needs of the large-scale computer user, Cray Research has developed software that runs within APOLLO DOMAIN and enables communication with a Cray Research CRAY-1 or CRAY X-MP mainframe. The CRAY Station Software Service for APOLLO DOMAIN provides the workstation user with COS interactive and batch features that complement workstation capabilities by providing access to the computational facilities of the CRAY system.

User features

A number of user features allow APOLLO users easy access to the power of Cray Research mainframes, including batch and interactive features, an APOLLO graphics library and a range of Station operation commands.

Interactive features
The APOLLO Station Software Service supports interactive use of the CRAY. The multiple process environment of the APOLLO allows users to create several interactive jobs at any given time. Following logon, the interactive user is prompted for username, usernumber and account number. The interactive process provides a CRAY program development environment and includes an applications interface to allow for distributed applications.

The APOLLO Station Software Service also provides a functional capability to execute interactive graphic output from the CRAY. A subset of the APOLLO graphics primitives is provided as FORTRAN callable routines residing in a library on the CRAY.

APOLLO graphics library
The APOLLO Station Software Service provides a graphics library residing on the APOLLO, corresponding to the subset of graphics primitives residing in a library on the CRAY. This library is extendable to encompass a larger set of the APOLLO graphics primitives.

Batch features
The APOLLO Station Software allows users easy access to the CRAY from any node on the DOMAIN network. A user can submit a job file to the CRAY with the following Program Manager Command:

CSUBMIT *pathname*

The APOLLO *pathname* refers to the file that contains the job control language and/or program that make up the CRAY job.

When running on the CRAY, a job can access and create files on the APOLLO DOMAIN network via the COS ACQUIRE, FETCH and DISPOSE control statements. This is known as dataset staging. All datasets being staged from the CRAY to the APOLLO are automatically saved on disk, as determined by the *pathname* specified in the text field of the COS DISPOSE control statement. For datasets being staged, either COS character blocked or binary blocked formats are allowable.

Station operation
A range of commands is provided for the system administrator to control the activation, deactivation and normal operation of the Station.

Configuration considerations

A CRAY mainframe may be connected to a variety of APOLLO DOMAIN configurations using the Network Systems Corporation (NSC) HYPERchannel.® The simplest configuration is a single APOLLO connected to the CRAY via an NSC HYPERchannel. A more complex arrangement is possible when more than one APOLLO is connected together via the DOMAIN architecture. The APOLLO Station Software Service will allow all APOLLO users on the DOMAIN network access to the CRAY on both an interactive and batch basis.

The connection between an APOLLO DOMAIN network and a CRAY mainframe is through an NSC A400 HYPERchannel adapter. The A400 is connected to an APOLLO node through an external MULTIBUS interface.

System manager capabilities

The APOLLO Station software is straightforward to install and may be adapted to meet site-specific requirements. APOLLO command procedures are provided to allow the system administrator to generate the Station.

Tailoring the Station configuration is a simple process of editing the configuration data file. Parameters that may be changed include:

- ☐ Number of logical data streams between the CRAY and the Station that may be active at any one time
- ☐ Station identity
- ☐ HYPERchannel address of the CRAY computer system
- ☐ Mailbox names for Station processes

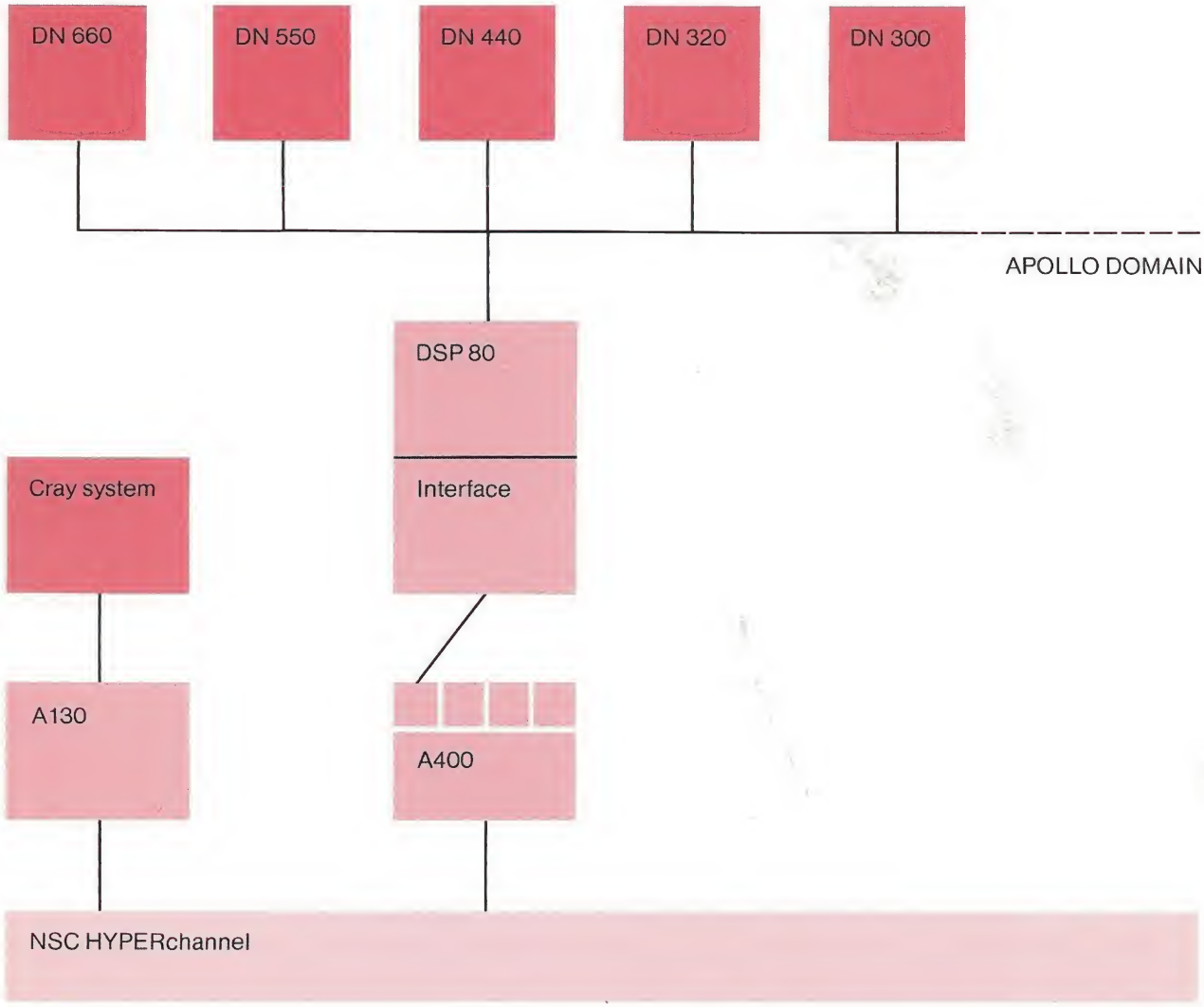
Station software structure

The components of the Station are modular, enabling multiple users to access the CRAY. These components communicate via the mailbox facility provided by AEGIS. The APOLLO Station Software Service consists of several processes that communicate through the APOLLO mailbox utility and three data files used to configure the Station and log information. The major functional components of the Station are:

- ☐ Device Driver and Interrupt Handler
- ☐ Station Concentrator
- ☐ Synchronous Concentrator
- ☐ CRAY Interactive (CINT)
- ☐ Station Master
- ☐ Terminal Master
- ☐ CRAY Batch (CBATCH)
- ☐ Station Configuration Data File

The Device Driver and Interrupt Handler modules direct the actual transfer of data from the APOLLO to the NSC A400 adapter. They also handle the interrupts associated with sending and receiving data over the HYPERchannel. The APOLLO GPIO software handles the mapping from virtual memory to Multibus (PNA) addresses.

Sample configuration



The Station Concentrator is a server process that resides on the node connected to the HYPERchannel. Users communicate with this module through the APOLLO mailbox utility. The Station Concentrator generates the appropriate Device Driver calls to send or receive messages and data from the CRAY. It also directs messages and data from the CRAY to the intended recipient.

The Synchronous Concentrator is a server process that resides on the node connected to the HYPERchannel. Interactive users communicate with the Synchronous Concentrator via the APOLLO mailbox utility. The module's main task is to coordinate all synchronous requests (interactive being a subset of the synchronous set of messages) and to multiplex interactive messages to and from the CRAY.

The CRAY Interactive Module (CINT) communicates with the Synchronous Concentrator through the APOLLO mailbox utility. CINT logs the user onto the CRAY and sends terminal input from the user to the Synchronous Concentrator in the form of an interactive request. Interactive replies from the CRAY are displayed in the user's process window.

The Station Master is a server process used to log the Station on and off of the CRAY and to maintain a log of Station activity and errors. The mailbox utility is used for communication between the Station Master and the Station Concentrator. Commands for logging the Station on and off are received from the Terminal Master through the mailbox.

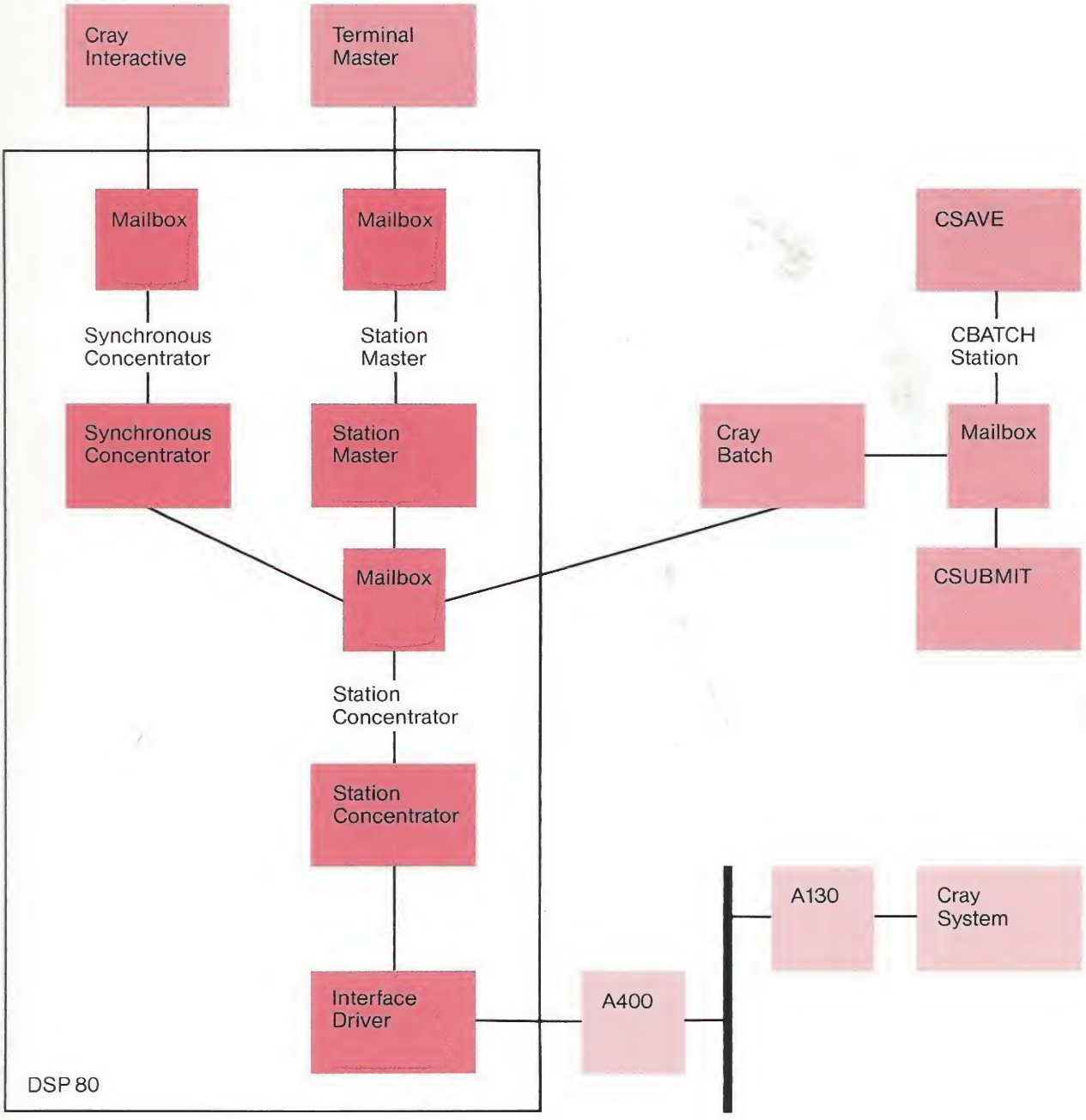
The Terminal Master communicates with the Station Master through a mailbox, taking Station command input from the keyboard, sending it to the Station Master, and displaying any reply received from the Station Master.

The CRAY Batch Module (CBATCH) is the batch file server and runs on each APOLLO network node used by Station users. This process sends permanent datasets to the CRAY, submits jobs to the CRAY and handles DISPOSE, FETCH and ACQUIRE functions.

The Station Configuration data file contains the necessary parameters for the operation of the Station. The following parameters are edited to change the Station Configuration.

- ☐ CRAY HYPERchannel address
- ☐ APOLLO HYPERchannel address
- ☐ Station Concentrator mailbox name
- ☐ Station Master mailbox name
- ☐ Synchronous Concentrator mailbox name
- ☐ Number of logical data streams between the CRAY and the Station
- ☐ Station identity
- ☐ Station type

Station software structure



CRAY RESEARCH, INC.

Corporate Headquarters
608 Second Avenue South
Minneapolis, MN 55402
612/333-5889

Domestic sales offices

Albuquerque, New Mexico
Atlanta, Georgia
Beltsville, Maryland
Boston, Massachusetts
Boulder, Colorado
Chicago, Illinois
Dallas, Texas
Houston, Texas
Laurel, Maryland
Los Angeles, California
Minneapolis, Minnesota
Pittsburgh, Pennsylvania
Pleasanton, California
Seattle, Washington
Tulsa, Oklahoma

International subsidiaries

Cray Canada Inc.
Toronto, Canada

Cray Research France, S.A.
Paris, France

Cray Research GmbH
Munich, West Germany

Cray Research Japan, Limited
Tokyo, Japan

Cray Research (UK) Limited
Bracknell, Berkshire
United Kingdom

MP-1010